POSITIONS AND AREAS OF SUN-SPOTS

[Communicated by Capt. J. F. Hellweg, U.S. Navy, Superintendent U.S. Naval Observatory. Data furnished by the U. S. Naval Observatory in cooperation with Harvard and Mount Wilson Observatories. The difference in longitude is measured from the central meridian, positive west. The north latitude is positive. Areas are corrected for foreshortening and are expressed in millionths of the sun's visible hemisphere. The total area for each day includes spots and groups]

NOTE.—Owing to the fact that many reports were missing at the time of going to press, the complete May 1934 data will be published in the next (June) issue of the REVIEW.—Editor.

PROVISIONAL SUN-SPOT RELATIVE NUMBERS FOR MAY 1934

(Dependent alone on observations at Zurich and its station at Arosa)

[Data furnished through the courtesy of Prof. W. Brunner, Eidgenössische Sternwarte, Zurich, Switzerland]

May 1934	Relative numbers	May 1934	Relative numbers	May 1934	Relative numbers
1	7	11	10	21	29
2	0	12	7	22	34
3	0	13	*d* 15	23	*a* 33
4	*Mc*–	14	21	24	23
5	17	15	26	25	19
6	*a* 21	16	25	26	17
7	26	17	*d*–	27	9
8	34	18	41	28	16
9	23	19	46	29	8
10	19	20	*a* 37	30	0
				31	0

Mean: 29 days—19.4.

a=Passage of an average-sized group through the central meridian.
c=New formation of a large center of activity; *E*, on the eastern part of the sun's disk; *W*, on the western part; *M*, in the central circle zone.
d=Entrance of a large or average-sized center of activity on the east limb.

AEROLOGICAL OBSERVATIONS

[Aerological Division, D. M. Little, in charge]

By L. T. SAMUELS

Free-air temperatures during May averaged above normal at all stations listed in table 1 except Pensacola where negative departures occurred at all levels. Exceptionally large positive temperature departures occurred at the northern stations. Free-air relative humidities averaged mostly below normal.

Free-air resultant wind directions were more northerly than normal over most southern stations and were more southerly than normal over the extreme northwest (table 2). Elsewhere the resultant directions were generally close to normal. The resultant velocities were close to normal except at a number of southern stations where they were mostly below normal.

TABLE 1.—*Free-air temperatures and relative humidities obtained by airplanes during May 1934*

TEMPERATURE (°C.)

Altitude (meters) m.s.l.	Boston, Mass.[1] (6 meters)		Cleveland, Ohio[2] (246 meters)		Dallas, Tex.[3] (146 meters)		Norfolk, Va.[4] (3 meters)		Omaha, Nebr.[5] (300 meters)		Pembina, N.Dak.[6] (243 meters)		Pensacola, Fla.[4] (2 meters)		San Diego, Calif.[4] (5 meters)		Washington, D.C.[4] (2 meters)	
	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal	Mean	Departure from normal
Surface	13.7	(7)	11.4	(7)	17.8	(7)	19.2	+0.5	15.8	(7)	7.8	(7)	21.1	−1.4	19.2	+0.9	16.0	−1.6
500	12.9	(7)	14.8	(7)	20.7	(7)	17.5	−0.2	17.4	(7)	10.8	(7)	19.6	−1.0	16.5	+1.9	15.3	−0.3
1,000	11.1	+3.1	14.1	+4.2	18.3	+1.7	15.8	0.0	17.7	+5.7	12.1	+4.0	17.2	−0.8	16.9	+2.5	14.2	+0.6
1,500	8.3	+3.4	11.3	+4.1	15.5	+0.8			15.1	+5.9	9.7	+4.2						
2,000	5.5	+3.3	8.4	+3.7	13.1	+0.8	10.3	+0.2	12.2	+5.6	7.0	+4.3	11.0	−1.6	14.0	+2.4	9.1	+0.5
2,500	3.3	+3.6	5.8	+3.5	9.9	+0.3			9.0	+5.1	3.9	+4.1						
3,000	0.8	+3.7	3.0	+3.2	7.2	+0.6	4.4	+0.1	5.9	+4.9	0.4	+3.3	5.4	−2.0	8.6	+2.4	4.3	+1.1
4,000	−4.6		−2.3	+3.6	1.6	+1.2			−1.7	+3.1	−6.1	+2.8	−0.8	−2.2	2.2	+2.3		
5,000	−11.2		−8.9	+2.9	−4.8	+0.5			−9.0	+1.7	−12.8	+2.0	−7.5	−1.8				

RELATIVE HUMIDITY (PERCENT)

Surface	69	(7)	73	(7)	85	(7)	77	+6	63	(7)	73	(7)	88	+7	68	0	70	+4
500	60	(7)	58	(7)	67	(7)	70	+8	60	(7)	61	(7)	83	+7	73	−2	61	+1
1,000	55	−16	51	−13	68	−1	62	+6	53	−9	51	−9	80	+11	58	−3	54	−2
1,500	55	−20	48	−14	66	+8			52	−10	49	−11						
2,000	58	−18	48	−10	61	+12	59	+6	50	−10	49	−10	77	+20	36	−2	52	−3
2,500	57	−14	47	−5	62	+17			49	−9	50	−8						
3,000	56	−9	48	0	56	+11	54	+3	48	−10	52	−5	70	+24	30	+2	48	−3
4,000	50		43	−2	41	−5			49	−10	55	+2	65	+31	30	+4		
5,000	50		41	−3	30	−23			48	−14	55	+4	61	+31				

Times of observations: Weather Bureau, 5 a.m.; Navy, 7 a.m.; and Massachusetts Institute of Technology, 8 a.m., E.S.T.

[1] Airplane observations made by M.I.T.; departures based on normals obtained from kite observations made at Blue Hill Meterological Observatory; Annals of the Astronomical Observatory of Harvard College (1904), vol. LVIII, pt. I, p. 59.

[2] Temperature departures based on normals determined by extrapolating latitudinally those of Royal Center, Ind., and Due West, S.C. Humidity departures based on normals of Royal Center, Ind.

[3] Temperature departures based on normals determined by interpolating latitudinally those of Groesbeck, Tex., and Broken Arrow, Okla. Humidity departures based on normals of Groesbeck, Tex.

[4] Naval air stations.

[5] Temperature and humidity departures based on normals of Drexel, Nebr.

[6] Temperature departures based on normals determined by extrapolating latitudinally those of Ellendale, N.Dak., and Drexel, Nebr. Humidity departures based on normals of Ellendale, N.Dak.

[7] Surface and 500-meter departures omitted because of difference in time of day between airplane observations and those of kites upon which the normals are based.

TABLE 2.—*Free-air resultant winds (meters per second) based on pilot balloon observations made near 7 a.m. (eastern standard time) during May 1934*

[Wind from N=360°, E=90°, etc.]

Altitude (meters) m.s.l.	Albuquerque, N. Mex. (1,554 meters)		Atlanta, Ga. (309 meters)		Bismarck, N.Dak. (518 meters)		Brownsville, Tex. (7 meters)		Burlington, Vt. (132 meters)		Cheyenne, Wyo. (1,873 meters)		Chicago, Ill. (192 meters)		Cleveland, Ohio (245 meters)		Dallas, Tex. (154 meters)		Havre, Mont. (762 meters)		Jacksonville, Fla. (14 meters)		Key West, Fla. (11 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	6	1.0	10	1.4	31	0.8	143	0.5	191	1.5	285	3.9	245	1.0	185	0.7	114	1.5	254	1.4	297	0.4	182	1.7
500	------	------	46	3.2	------	------	165	3.8	252	3.1	------	------	236	4.5	253	2.0	160	4.3	------	------	232	1.8	160	3.0
1,000	------	------	68	2.5	303	0.6	154	1.7	289	5.0	------	------	262	5.2	291	4.5	162	2.7	257	4.3	244	2.6	190	3.2
1,500	------	------	51	2.0	306	3.9	39	1.4	287	6.3	------	------	274	6.1	292	5.4	156	1.6	268	6.6	212	1.7	199	2.5
2,000	222	0.7	8	1.6	292	4.7	356	2.1	293	7.8	275	6.2	296	5.0	289	6.1	75	0.6	263	7.2	224	2.5	214	3.2
2,500	244	1.6	338	1.2	280	6.0	345	3.5	289	8.2	277	5.8	295	5.4	287	6.9	41	2.2	259	7.5	238	3.1	225	4.7
3,000	270	2.9	326	1.3	287	8.2	336	3.6	291	9.7	279	4.6	301	5.8	296	7.0	29	4.3	261	7.7	249	4.1	235	4.2
4,000	276	4.1	272	1.7	291	11.3	309	4.3	278	8.5	280	4.7	306	6.0	305	7.4	42	6.7	269	10.3	253	2.8	260	5.1
5,000	276	3.0	338	4.7	296	9.5	321	3.9	------	------	278	4.6	1	7.2	4	7.3	------	------	264	12.4	294	3.6	276	6.5

Altitude (meters) m.s.l.	Los Angeles, Calif. (217 meters)		Medford, Oreg. (410 meters)		Memphis, Tenn. (83 meters)		New Orleans, La. (19 meters)		Oakland, Calif. (8 meters)		Oklahoma City, Okla. (402 meters)		Omaha, Nebr. (306 meters)		Phoenix, Ariz. (338 meters)		Salt Lake City, Utah (1,294 meters)		Sault Ste. Marie, Mich. (198 meters)		Seattle, Wash. (14 meters)		Washington, D.C. (10 meters)	
	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity	Direction	Velocity
	°		°		°		°		°		°		°		°		°		°		°		°	
Surface	69	0.5	294	0.5	58	0.6	56	1.4	243	1.2	153	2.2	161	2.2	113	1.5	158	3.5	20	0.3	164	0.6	3	0.8
500	121	1.6	284	1.3	136	2.5	126	2.1	285	3.1	165	4.9	196	6.0	202	1.1	------	------	239	2.4	183	2.1	324	2.2
1,000	27	.8	296	1.2	108	1.7	122	3.1	301	5.6	183	7.8	229	9.1	261	2.1	------	------	270	6.6	190	1.3	316	4.2
1,500	295	2.4	129	.2	88	.9	122	2.1	295	3.9	190	3.0	239	6.8	246	2.2	166	5.0	283	8.5	264	1.0	302	6.0
2,000	258	2.5	200	1.5	29	1.3	84	1.1	272	4.0	113	.9	246	5.1	218	2.5	182	4.9	280	9.4	237	1.7	294	6.6
2,500	245	2.4	211	2.7	23	2.3	358	1.4	258	4.8	42	1.2	269	4.3	195	4.0	204	4.5	287	11.3	219	3.6	293	6.2
3,000	253	2.2	213	3.2	34	2.5	344	3.5	248	4.3	32	3.1	287	4.0	195	5.8	227	4.8	288	11.4	227	3.9	293	7.1
4,000	113	.5	202	4.8	224	.5	309	5.2	251	7.8	19	4.6	307	5.2	197	7.2	241	6.3	302	9.1	221	7.5	292	6.4
5,000	------	------	------	------	------	------	------	------	------	------	------	------	326	5.4	204	3.8	283	6.9	299	10.8	217	3.8	------	------

RIVERS AND FLOODS

By RICHMOND T. ZOCH

[River and Flood Division, MONTROSE W. HAYES, in charge]

A moderate flood occurred in the Connecticut River in April, but little damage resulted since all were prepared for it, having been advised of the considerable depth of snow over the basin, and the consequent likelihood of a spring flood.

Minor floods occurred in some of the rivers of the Southeastern States and a slight one in the Neosho River in Kansas. No damage was caused by any of them.

Most rivers in the Mississippi system were exceptionally low for this month of the year.

Any noteworthy features that may be reported of the flood in the Columbia River will be mentioned in a later issue of the MONTHLY WEATHER REVIEW.

Table of Flood Stages during May 1934

[All dates are in May unless otherwise specified]

River and station	Flood stage	Above flood stages—dates		Crest	
		From—	To—	Stage	Date
ATLANTIC SLOPE DRAINAGE					
	Feet			*Feet*	
Neuse: Neuse, N.C.	13	18	18	14.4	18
Saluda: Pelzer, S.C.	7	16	16	7.0	16
Santee: Rimini, S.C.	12	3	6	12.8	5
		17	21	14.5	20
		23	27	13.4	26
		30	31	13.2	31
Savannah: Ellenton, S.C.	14	2	5	15.4	4
		18	21	16.8	20
Ogeechee: Dover, Ga.	7	9	10	7.0	9
MISSISSIPPI SYSTEM					
Arkansas Basin					
Neosho: Le Roy, Kans.	18	14	15	22.5	15
PACIFIC SLOPE DRAINAGE					
Columbia Basin					
Columbia:					
Marcus, Wash.	24	Apr. 21	(1)	(1)	(1)
Vancouver, Wash.	15	Apr. 29	25	17.1	9, 10
		29	(1)	(1)	(1)

[1] Flood continued into June.